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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/989,960	11/21/2001	Rickie C. Lake	M140-338	2333

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EXAMINER

HARAN, JOHN T

ART UNIT	PAPER NUMBER
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1733

DATE MAILED: 02/13/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/989,960	Applicant(s) LAKE, RICKIE C.	
	Examiner John T. Haran	Art Unit 1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 15-22 and 29-56 is/are pending in the application.
- 4a) Of the above claim(s) 1-8 and 15-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 29-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>4,5,9</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The preliminary amendment filed on 11/21/01 has been entered. It is noted that this amendment indicates that only claims 29-56 are pending, however claims 1-8 and 15-22 have not been cancelled. It appears claims 1-8 and 15-22 were intended to be cancelled since they were examined and allowed in parent application 09/022,812 and should be cancelled in response to this action.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 45-47 are rejected under 35 U.S.C. 102(b) as being anticipated by Kropp et al (U.S. Patent 5,362,421).

Kropp et al disclose a method of conductively interconnecting electronic components by interposing a curable, electrically conductive adhesive composition comprising an epoxy with a glycidoxypropyltrimethoxysilane coupling agent between a first and second electronic component and then curing the adhesive to create an electrically conductive bond that electrically interconnects the first and second components (Abstract, Column 6, lines 1-8). Kropp et al clearly anticipate claims 9 and

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4. Claims 45, 48, and 49 are rejected under 35 U.S.C. 102(b) as being anticipated by Chen et al (U.S. Patent 4,975,221).

Chen et al discloses a curable epoxy adhesive for use in attaching electrical components together, such as semiconductor die or chips to a substrate, to form a connection wherein the epoxy adhesive contains an electrically conductive filler and an epoxy functional silane adhesion promoter (Column 1, lines 5-11 and Column 3, line 59 to Column 4, line 5).

Regarding claims 48 and 49, Chen et al teach having the adhesion promoter be 0 to 2 percent by weight (Column 4, lines 15-20).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 48-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kropp et al (U.S. Patent 5,362,241).

Regarding claims 48 and 49, Kropp et al is silent towards the weight percent of epoxy terminated silane, however it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the desired weight percentages of the epoxy terminated silane in the adhesive composition in the method of Kropp et al and only the expected ^{results} would be achieved.

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7. Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kropp et al as applied to claim 45 above, and further in view of Tuttle (U.S. Patent 5,558,679).

One skilled in the art would have readily appreciated that it is well known and conventional to electrically interconnect electronic components via an epoxy adhesive wherein one of the electronic components ^{has} a surface with metal containing nickel, as shown for example in Tuttle (Column 3, lines 60-61) and that Kropp et al are a general teaching for interconnecting electronic parts. It would have been obvious to one of ordinary skill in the art at the time the invention was made to connect an electrical component with a nickel containing metal surface to another electrical component in the method of Kropp et al as suggested in Tuttle.

8. Claims 46-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al (U.S. Patent 4,975,221) in view of Tsukagoshi et al (U.S. Patent 5,843,251), Kropp et al (U.S. Patent 5,362,421), or Inoue et al (U.S. Patent 5,728,473).

Chen et al are silent towards the type of silane utilized as the adhesion promoter, however Chen et al do teach any type of epoxy terminated silanes are suitable as the adhesion promoter (Column 4, lines 4-5).

Glycidoxy methoxy silanes are well known and conventional adhesion promoters/coupling agents, as evidenced for example in Tsukagoshi et al, Kropp et al, and Inoue et al. Tsukagoshi et al is directed to a method for electrically connecting circuits by interposing an epoxy adhesive between two circuits (Column 3, lines 30-35). The reference teaches adding a silane coupling agent to the epoxy in order to strengthening the adhesive interface of the circuits and to improve moisture resistance,

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such as glycidoxypropyltrimethoxysilane (Column 10, line 62 to Column 11, line 12).

Kropp et al also teach adding a silane coupling agent to a curable, electrically conductive epoxy adhesive such as glycidoxypropyltrimethoxysilane for interconnecting electronic parts (Abstract, Column 6, lines 1-9). Inoue et al also teach adding a silane coupling agent to a curable epoxy adhesive such as glycidoxypropyltrimethoxysilane for interconnecting electronic components. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a known silane adhesion promoter, such as glycidoxypropyltrimethoxysilane, in the epoxy adhesive in the method of Chen et al.

9. Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al as applied to claim 45 above, and further in view of Tuttle (U.S. Patent 5,558,679).

One skilled in the art would have readily appreciated that it is well known and conventional to electrically interconnect electronic components via an epoxy adhesive wherein one of the electronic components a surface with metal containing nickel, as shown for example in Tuttle (Column 3, lines 60-61) and that Chen et al are a general teaching for interconnecting electronic parts. It would have been obvious to one of ordinary skill in the art at the time the invention was made to connect an electrical component with a nickel containing metal surface to another electrical component in the method of Chen et al, as modified above, as suggested in Tuttle.

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10. Claims 29, 32-36, and 51-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuttle (U.S. Patent 5,558,679) in view of Chen et al (U.S. Patent 4,975,221).

Tuttle is directed to a method for mounting a battery on a substrate wherein a thin profile battery is mounted on a substrate with at least one node location and is electrically interconnected to the substrate and node with an electrically conductive epoxy (Column 2, line 63 to Column 3, line 29). Tuttle is silent towards the epoxy adhesive having a terminated silane.

It is well known and conventional to include epoxy terminated silanes adhesion promoters in adhesives when bonding together electrical components in order to ensure better adhesion, as shown for example in Chen et al. Chen et al discloses a curable epoxy adhesive for use in attaching electrical components together to form a connection wherein the epoxy adhesive contains an electrically conductive filler and an epoxy functional silane adhesion promoter (Column 1, lines 5-11 and Column 3, line 59 to Column 4, line 5). One skilled in the art would have readily appreciated including well known adhesion promoters, such as epoxy terminated silanes, for use in ensuring adequate adhesion between electrical components as is conventional in the art, in the adhesive of Tuttle. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include epoxy terminated silanes in the adhesive of Tuttle in order to promote adhesion.

Regarding claims 32 and 33, one skilled in the art would have readily appreciated that adhesion promoters, such as epoxy terminated silanes, comprise a small weight

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percentage as shown in Chen et al teach including the adhesion promoter in an amount of 0% to 2% by weight (Column 4, lines 16-21). It would have been obvious for the weight percent to be less than or equal to 2% or 1% by weight.

Regarding claims 34-36, Tuttle teaches a button type battery with a terminal housing of nickel clad stainless steel (Column 3, lines 55-61). Tuttle also teaches the conductive traces are screen printed on the substrate (Column 5, lines 4-5), however is silent towards them being conductive ink. It is well known and conventional to use conductive ink as traces and it would have been obvious to do so in apparatus of Tuttle.

Regarding claims 51 and 52, Applicant teaches that the concentration of silane in an epoxy terminated silane lowers the resistance of the adhesive and thereby lowers the contact resistance through a metal surface (Specification, page 6, line 15 to page 7 line 10). While Chen and Tuttle are silent towards the epoxy having an effective metal surface wetting concentration of silane that results in a contact resistance through the metal surface of less than or equal to about .032 ohm-cm², Chen et al disclose the composition of the epoxy adhesive listing each component in terms of part by weight (See Column 4, lines 15-21). Applicant teaches that the effective concentration of the silane needed to obtain the desired contact resistances is less than 2% by weight and preferably less than 1% by weight (Specification, page 6, line 15 to page 7 line 10). It is clear from the composition listing in Chen et al that the adhesion promoter (epoxy functional silane) comprises less than 1% by weight. One skilled in the art would have readily appreciated that the concentration of silane taught in the adhesive of Chen et al is within the effective concentration range taught by Applicant and that therefore it would

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be expected for the adhesive of Tuttle, as modified above to have adhesion promoter in the amounts suggested by Chen et al, to have a contact resistance of the desired values (i.e. less than 0.16, or 0.032 ohm-cm²).

11. Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuttle (U.S. Patent 5,558,679) in view of Chen et al (U.S. Patent 4,975,221) as applied to claim 29 above, and further in view of Tsukagoshi et al (U.S. Patent 5,843,251), Kropp et al (U.S. Patent 5,362,421), or Inoue et al (U.S. Patent 5,728,473).

Tuttle and Chen et al are silent towards the type of silane utilized as the adhesion promoter, however Chen et al do teach any type of epoxy terminated silanes are suitable as the adhesion promoter (Column 4, lines 4-5).

Glycidoxy methoxy silanes are well known and conventional adhesion coupling/coupling agents, as evidenced for example in Tsukagoshi et al, Kropp et al, and Inoue et al. Tsukagoshi et al is directed to a method for electrically connecting circuits by interposing an epoxy adhesive between two circuits (Column 3, lines 30-35). The reference teaches adding a silane coupling agent to the epoxy in order to strengthening the adhesive interface of the circuits and to improve moisture resistance, such as glycidoxypropyltrimethoxysilane (Column 10, line 62 to Column 11, line 12). Kropp et al also teach adding a silane coupling agent to a curable, electrically conductive epoxy adhesive such as glycidoxypropyltrimethoxysilane for interconnecting electronic parts (Abstract, Column 6, lines 1-9). Inoue et al also teach adding a silane

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coupling agent to a curable epoxy adhesive such as glycidoxypyltrimethoxysilane for interconnecting electronic components.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a known silane adhesion promoter, such as glycidoxypyltrimethoxysilane, in the epoxy adhesive of Tuttle.

12. Claims 37, 40-44, and 53-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuttle (U.S. Patent 5,558,679) in view of Chen et al (U.S. Patent 4,975,221) as applied to claim 29 above, and further in view of Tuttle (U.S. Patent 5,646,592).

Tuttle '679 is silent towards the substrate to which the battery is bonded has conductive paths including an antenna and an integrated circuit chip mounted also mounted on the substrate to create a radio frequency device.

It is well known and conventional in the radio frequency device art to have a substrate with a conductive path including an antenna, an integrated circuit chip mounted to the substrate in electrical connection with a first portion of the substrate conductive paths and a battery mounted over and in electrical connection with a second portion of the conductive paths, as shown for example in Tuttle '592 (Column 2, lines 50-57; Column 3, lines 27-30). One skilled in the art would have readily appreciated using known substrates to which batteries are electrically connected in the method of Tuttle '679. It would have been obvious to one of ordinary skill in the art at the time the

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invention was made to use the substrate of Tuttle '592 in the product of Tuttle '679, as modified above to have an epoxy terminated silane adhesion promoter.

Regarding claims 40 and 41, one skilled in the art would have readily appreciated that adhesion promoters, such as epoxy terminated silanes, comprise a small weight percentage as shown in Chen et al teach including the adhesion promoter in an amount of 0% to 2% by weight (Column 4, lines 16-21). It would have been obvious for the weight percent to be less than or equal to 2% or 1% by weight.

Regarding claims 42-44, Tuttle '679 teaches a button type battery with a terminal housing of nickel clad stainless steel (Column 3, lines 55-61). Tuttle also teaches the conductive traces are screen printed on the substrate (Column 5, lines 4-5), however is silent towards them being conductive ink. It is well known and conventional to use conductive ink as traces and it would have been obvious to do so in Tuttle '679, as modified above.

Regarding claims 53-56, Applicant teaches that the concentration of silane in an epoxy terminated silane lowers the resistance of the adhesive and thereby lowers the contact resistance through a metal surface (Specification, page 6, line 15 to page 7 line 10). While Chen and Tuttle are silent towards the epoxy having an effective metal surface wetting concentration of silane that results in a contact resistance through the metal surface of less than or equal to about .032 ohm-cm², Chen et al disclose the composition of the epoxy adhesive listing each component in terms of part by weight (See Column 4, lines 15-21). Applicant teaches that the effective concentration of the silane needed to obtain the desired contact resistances is less than 2% by weight and

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preferably less than 1% by weight (Specification, page 6, line 15 to page 7 line 10). It is clear from the composition listing in Chen et al that the adhesion promoter (epoxy functional silane) comprises less than 1% by weight. One skilled in the art would have readily appreciated that the concentration of silane taught in the adhesive of Chen et al is within the effective concentration range taught by Applicant and that therefore it would be expected for the adhesive of Tuttle '679, as modified above to have adhesion promoter in the amounts suggested by Chen et al, to have a contact resistance of the desired values (i.e. less than 0.16, or 0.032 ohm-cm²).

13. Claims 38 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuttle (U.S. Patent 5,558,679) in view of Chen et al (U.S. Patent 4,975,221) as applied to claim 29 above, and further in view of Tuttle (U.S. Patent 5,646,592), as applied to claim 37 above, and further in view of Tsukagoshi et al (U.S. Patent 5,843,251), Kropp et al (U.S. Patent 5,362,421), or Inoue et al (U.S. Patent 5,728,473).

Tuttle'679 and Chen et al are silent towards the type of silane utilized as the adhesion promoter, however Chen et al do teach any type of epoxy terminated silanes are suitable as the adhesion promoter (Column 4, lines 4-5).

Glycidoxymethoxy silanes are well known and conventional adhesion coupling/coupling agents, as evidenced for example in Tsukagoshi et al, Kropp et al, and Inoue et al. Tsukagoshi et al is directed to a method for electrically connecting circuits by interposing an epoxy adhesive between two circuits (Column 3, lines 30-35). The reference teaches adding a silane coupling agent to the epoxy in order to

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strengthening the adhesive interface of the circuits and to improve moisture resistance, such as glycidoxypropyltrimethoxysilane (Column 10, line 62 to Column 11, line 12).

Kropp et al also teach adding a silane coupling agent to a curable, electrically conductive epoxy adhesive such as glycidoxypropyltrimethoxysilane for interconnecting electronic parts (Abstract, Column 6, lines 1-9). Inoue et al also teach adding a silane coupling agent to a curable epoxy adhesive such as glycidoxypropyltrimethoxysilane for interconnecting electronic components.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a known silane adhesion promoter, such as glycidoxypropyltrimethoxysilane, in the epoxy adhesive of Tuttle '679, as modified above.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **John T. Haran** whose telephone number is **(703) 305-0052**. The examiner can normally be reached on M-Th (8 - 5) and alternate Fridays.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael W. Ball can be reached on (703) 308-2058. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


John T. Haran

February 4, 2003


Michael W. Ball
Supervisory Patent Examiner
Technology Center 1700